Charge Questions

The Effects of Mountaintop Mines and Valley fills on Aquatic Ecosystems of the Central Appalachian Coalfields

Michael Slimak

July 20, 2010

Charge Question 1

The Mountaintop Mining Assessment uses a conceptual model (Figure 12 of the draft document) to formulate the problem consistent with EPA's Ecological Risk Assessment Guidelines.

Does the conceptual diagram include the key direct and indirect ecological effects of MTM-VF? If not, please indicate the effects or pathways that are missing or need additional elucidation.

Charge Question 2

This report relied solely on peer-reviewed, published literature and the 2005 Final Programmatic Environmental Impact Assessment on Mountaintop Mining/Valley Fills.

Does this assessment report include the most relevant peer-reviewed, published literature on this topic? If not, please indicate which references are missing.

Charge Question 3

Valley fills result in the direct loss of headwater streams.

Has the review appropriately characterized the ecological effects of the loss of headwater streams?

Charge Question 4

In addition to impacts on headwater streams, mining and valley fills affect downstream water quality and stream biota.

Does the report effectively characterize the causal linkages between MTM-VF, downstream water quality, and effects on stream biota?

Charge Question 5

The published literature is sparse regarding the cumulative ecological impacts of filling headwater streams with mining waste (spoil).

Does the review accurately describe the state of knowledge on cumulative ecological impacts of MTM-VF? If not, how can it be improved?

Charge Question 6

The Surface Mining Control and Reclamation Act and its implementing regulations set requirements for ensuring the restoration of lands disturbed by mining through restoring topography, providing for post-mining land use, requiring re-vegetation, and ensuring compliance with the Clean Water Act.

Does the review appropriately characterize the effectiveness of currently employed restoration methods?

Charge Questions

Field Based Methodology for Deriving Water Quality Benchmarks

Michael Slimak

July 21, 2010

Charge Question 1

The data sets used to derive a conductivity benchmark (described in Section 2 of this report) were developed primarily by two central Appalachian states (WV and KY).

Please comment on the adequacy of these data and their use in developing a conductivity benchmark.

Charge Question 2

The derivation of a benchmark value for conductivity was adapted from EPA's methods for deriving water quality criteria. The water quality criteria methodology relies on a lab-based procedure, whereas this report uses a field-based approach.

Has the report adapted the water quality criteria methodology to derive a water quality advisory for conductivity using field data in a way that is clear, transparent and reasonable?

Charge Question 3

Appendix A of the report describes the process used to establish a causal relationship between the extirpation of invertebrate genera and levels of conductivity.

Has the report effectively made the case for a causal relationship between species extirpation and high levels of conductivity due to surface coal mining activities?

Charge Question 4

In using field data, other variables and factors have to be accounted for in determining causal relationships. Appendix B of the report describes the techniques for dealing with confounding factors.

Does the report effectively consider other factors that may confound the relationship between conductivity and extirpation of invertebrates? If not, how can the analysis be improved?

Charge Question 5

Uncertainty values were analyzed using a boot-strapped statistical approach.

Does the SAB agree with the approach used to evaluate uncertainty in the benchmark value? If not, how can the uncertainty analysis be improved?

Charge Question 6

The field-based method results in a benchmark value that the report authors believe is comparable to a chronic endpoint.

> **Does the Panel agree that the benchmark derived using this method provides for a degree of protection comparable to the chronic endpoint of conventional ambient water quality criteria?**

Charge Question 7

As described, the conductivity benchmark is derived using central Appalachian field data and has been validated within ecoregions 68, 69, and 70.

Under what conditions does the SAB believe this method would be transferable to developing a conductivity benchmark for other regions of the United States whose streams have a different ionic signature?

Charge Question 8

The amount and quality of field data available from the states and the federal government have substantially increased throughout the years. In addition, the computing power available to analysts continues to increase.

Given these enhancements in data availability and quality and computing power, does the Panel feel it feasible and advisable to apply this field-based method to other pollutants? What issues should be considered when applying the method to other pollutants?